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NOTICE OF ALLOWANCE AND FEE(S) DUE

2292 7590 07/02/2008

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

YODER III, CHRISS S

ART UNIT

PAPER NUMBER

2622

DATE MAILED: 07/02/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/620,459

07/17/2003

Nobuo Suzuki

0649-0902P

9186

TITLE OF INVENTION: SOLID-STATE IMAGE PICK-UP DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	10/02/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

2292 7590 07/02/2008

**BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747**

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,459	07/17/2003	Nobuo Suzuki	0649-0902P	9186

TITLE OF INVENTION: SOLID-STATE IMAGE PICK-UP DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	10/02/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
YODER III, CHRISS S	2622	348-303000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
 (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/620,459	07/17/2003	Nobuo Suzuki	0649-0902P	9186
2292	7590	07/02/2008	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			YODER III, CHRISS S	
			ART UNIT	PAPER NUMBER
			2622	
DATE MAILED: 07/02/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 821 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 821 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/620,459

Examiner

CHRISS S. YODER III

Applicant(s)

SUZUKI ET AL.

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 04/30/2008.
2. ☒ The allowed claim(s) is/are 1 and 3-8 (now renumbered 1-7).
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622

DETAILED ACTION

Response to Amendment

The declaration under 37 CFR 1.132 filed April 30, 2008 is sufficient to overcome the rejection of claims 1 and 3-8 based on the previously relied upon "Applicant's Admitted Prior Art" applied under 35 U.S.C. 103.

Allowable Subject Matter

Claims 1 and 3-8 are allowed.

The following is an examiner's statement of reasons for allowance:

As for **claim 1**, the prior art does not teach or fairly suggest the use of a solid-state image pick-up device having a plurality of photoelectric converting devices arranged in a row direction and a column direction orthogonal thereto over a surface of a semiconductor substrate, comprising a vertical transfer section for transferring charges from the photoelectric converting devices in the column direction, a horizontal transfer section for transferring the charges from the vertical transfer section in the row direction, and an output section for outputting a signal corresponding to a charge transferred through the horizontal transfer section, wherein the photoelectric converting device includes a plurality of high-sensitivity photoelectric converting devices arranged like a tetragonal grid in the row direction and the column direction orthogonal thereto and serving to carry out a photoelectric conversion having a relatively high sensitivity, and a plurality of low-sensitivity photoelectric converting devices arranged like the tetragonal grid in the row direction and the column direction orthogonal thereto

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and serving to carry out a photoelectric conversion having a relatively low sensitivity, the high-sensitivity photoelectric converting devices and the low-sensitivity photoelectric converting devices are arranged at an equal array pitch in positions shifted by $1/2$ of the array pitch from each other in the row direction and the column direction, the vertical transfer section includes a plurality of vertical transfer channels formed on the semiconductor substrate corresponding to the photoelectric converting devices provided in the column direction, a plurality of vertical transfer electrodes formed to cross each of the vertical transfer channels as seen on a plane, and a charge reading regions for reading the charges of the photoelectric converting devices onto the vertical transfer channels, each of the vertical transfer channels takes a winding shape extended wholly in the column direction between the photoelectric converting devices, each of the vertical transfer electrodes takes a winding shape extended wholly in the row direction between the photoelectric converting devices, the charge reading regions of the photoelectric converting devices which are adjacent to each other in the column direction are formed between the adjacent photoelectric converting devices and the vertical transfer channels which are different from each other, four vertical transfer electrodes are provided corresponding to one of the photoelectric converting device adjacent to each other in the column direction, other four vertical transfer electrodes are provided corresponding to the other of the photoelectric devices adjacent to each other in the column direction, and the vertical transfer electrodes are driven by vertical transfer pulses having eight phases.

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As for **claim 3**, the prior art does not teach or fairly suggest the use of a solid-state image pick-up device having a plurality of photoelectric converting devices arranged in a row direction and a column direction orthogonal thereto over a surface of a semiconductor substrate, comprising a vertical transfer section for transferring charges from the photoelectric converting devices in the column direction, a horizontal transfer section for transferring the charges from the vertical transfer section in the row direction, and an output section for outputting a signal corresponding to a charge transferred through the horizontal transfer section, wherein the photoelectric converting device includes a plurality of high-sensitivity photoelectric converting devices arranged like a tetragonal grid in the row direction and the column direction orthogonal thereto and serving to carry out a photoelectric conversion having a relatively high sensitivity, and a plurality of low-sensitivity photoelectric converting devices arranged like the tetragonal grid in the row direction and the column direction orthogonal thereto and serving to carry out a photoelectric conversion having a relatively low sensitivity, the high-sensitivity photoelectric converting devices and the low-sensitivity photoelectric converting devices are arranged at an equal array pitch in positions shifted by $1/2$ of the array pitch from each other in the row direction and the column direction, the vertical transfer section includes a plurality of vertical transfer channels formed on the semiconductor substrate corresponding to the photoelectric converting devices provided in the column direction, a plurality of vertical transfer electrodes formed to cross each of the vertical transfer channels as seen on a plane, and charge reading regions for reading the

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charges of the photoelectric converting devices onto the vertical transfer channels, each of the vertical transfer channels takes a winding shape extended wholly in the column direction between the photoelectric converting devices, each of the vertical transfer electrodes takes a winding shape extended wholly in the row direction between the photoelectric converting devices, the charge reading regions of the photoelectric converting devices which are adjacent to each other in the column direction are formed between the adjacent photoelectric converting devices and the vertical transfer channels which are different from each other, two vertical transfer electrodes are provided corresponding to one of the photoelectric converting device adjacent to each other in the column direction, other two vertical transfer electrodes are provided corresponding to the other of the photoelectric converting devices adjacent to each other in the column direction, and the vertical transfer electrodes are driven by vertical transfer pulses having four phases.

As for **claim 4**, the prior art does not teach or fairly suggest the use of a solid-state image pick-up device having a plurality of photoelectric converting devices arranged in a row direction and a column direction orthogonal thereto over a surface of a semiconductor substrate, comprising a vertical transfer section for transferring charges from the photoelectric converting devices in the column direction, a horizontal transfer section for transferring the charges from the vertical transfer section in the row direction, and an output section for outputting a signal corresponding to a charge transferred through the horizontal transfer section, wherein the photoelectric converting device includes a plurality

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of high-sensitivity photoelectric converting devices arranged like a tetragonal grid in the row direction and the column direction orthogonal thereto and serving to carry out a photoelectric conversion having a relatively high sensitivity, and a plurality of low-sensitivity photoelectric converting devices arranged like the tetragonal grid in the row direction and the column direction orthogonal thereto and serving to carry out a photoelectric conversion having a relatively low sensitivity, the high-sensitivity photoelectric converting devices and the low-sensitivity photoelectric converting devices are arranged at an equal array pitch in positions shifted by $1/2$ of the array pitch from each other in the row direction and the column direction, the vertical transfer section includes a plurality of vertical transfer channels formed on the semiconductor substrate corresponding to the photoelectric converting devices provided in the column direction, a plurality of vertical transfer electrodes formed to cross each of the vertical transfer channels as seen on a plane, and charge reading regions for reading the charges of the photoelectric converting device onto the vertical transfer channels, the vertical transfer channel takes such a shape as to connect two winding shapes extended wholly in the column direction between the photoelectric converting devices, the vertical transfer electrode takes a winding shape extended wholly in the row direction between the photoelectric converting devices, the respective vertical transfer channels are shared for the transfer of the charges from the high-sensitivity photoelectric converting devices for one column and the transfer of the charges from the low-sensitivity photoelectric converting devices for another adjacent column, two vertical transfer electrodes

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are provided corresponding to the high-sensitivity photoelectric converting device for one column, other two vertical transfer electrodes are provided corresponding to the low-sensitivity photoelectric converting device for the other adjacent column, and the vertical transfer electrodes are driven by vertical transfer pulses having four phases.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISS S. YODER III whose telephone number is (571)272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S. Y./
Examiner, Art Unit 2622

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622